

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the subject application:

1. (Currently amended) A reactor for CO control comprising:
a reactor vessel having a water-gas shift catalyst zone, a mixed catalyst zone downstream of the water-gas shift catalyst zone, and a methanation catalyst zone disposed downstream of the mixed catalyst zone;
at least one water-gas shift catalyst disposed in said water-gas shift catalyst zone;
at least one methanation catalyst disposed in said methanation catalyst zone; and
a mixture of said at least one water-gas shift catalyst and said at least one methanation catalyst disposed in said mixed catalyst zone.
2. (Currently amended) A reactor in accordance with Claim 1, wherein said mixture comprises a catalytic gradient whereby a concentration of said at least one methanation catalyst increases in a direction of said methanation catalyst zone.

3. (Original) A reactor in accordance with Claim 1, wherein said at least one water-gas shift catalyst comprises Cu and Zn.

4. (Currently amended) A reactor in accordance with Claim 1, wherein said at least one methanation catalyst is selected from the group consisting of nickel, iron, ruthenium, platinum, rhodium, and alloys of nickel, iron, ruthenium, platinum, and rhodium and combinations thereof.

5. (Currently amended) An apparatus for conversion of a hydrocarbon fuel to a fuel gas suitable for use in a fuel cell comprising:

a reformer vessel suitable for reforming said hydrocarbon fuel to a reformed gas mixture comprising CO, CO₂, H₂O and H₂;

a reactor vessel having a water-gas shift ~~catalyst~~ zone, a mixed catalyst zone downstream of said water-gas shift catalyst zone, and a methanation ~~catalyst~~ zone downstream of said mixed catalyst zone in fluid communication with said reformer vessel; and

at least one water-gas shift catalyst disposed in said water-gas shift ~~catalyst~~ zone, at least one methanation catalyst disposed in said methanation ~~catalyst~~

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zone, and a mixture of said at least one water-gas shift catalyst and said at least one methanation catalyst disposed in said mixed catalyst zone.

6. (Currently amended) An apparatus in accordance with Claim 5, wherein said mixture comprises a catalytic gradient whereby a concentration of said at least one methanation catalyst increases in a direction of said methanation catalyst zone.

7. (Original) An apparatus in accordance with Claim 5, wherein said at least one water-gas shift catalyst comprises Cu and Zn.

8. (Currently amended) An apparatus in accordance with Claim 5, wherein said at least one methanation catalyst is selected from the group consisting of nickel, iron, ruthenium, platinum, rhodium, ~~and~~ alloys of nickel, iron, ruthenium, platinum, and rhodium and combinations thereof.

9. (Currently amended) An apparatus in accordance with Claim 7, wherein said at least one methanation catalyst is selected from the group consisting

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of nickel, iron, ruthenium, platinum, rhodium, ~~and~~ alloys of nickel, iron, ruthenium, platinum, and rhodium and combinations thereof.

Claims 10-17 (Canceled)